Missouri Department of Transportation

Bridge Division

Bridge Design Manual

Section 2.5

Revised 03/11/2003

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Index of General Quantities

2.5.1 Index of Quantities

The following list of pay items shall be used as a guide when preparing the Table of Estimated Quantities. The pay items shall be listed on the plans in numerical order according to the Item Number. The Item Number is for information only and is not to be listed in the Table of Estimated Quantities. For pay items not listed, see the Plans Review Section.

Item Number	Accuracy	Units	Item Description
202-10.10	1.0	each	Removal of Bridge
202-10.20	1.0	lump sum	Removal of Bridges
202-10.27	1.0	sq. foot	Partial Removal of Existing Bridge Deck
202-10.29	1.0	lump sum	Partial Removal of Culvert Concrete
202-10.30	1.0	sq. foot	Removal of Existing Bridge Deck *Note: Use for normal deck removals.*
202-10.32	1.0	lump sum	Partial Removal of Culvert Concrete (Bridges)
202-10.33	1.0	lump sum	Removal of Existing Bridge Deck *Note: Use for special cases of deck removal.*
202-10.35	1.0	sq. foot	Seal Coat Removal (Bridges) *Note: Do not use for unbonded seal coat removal.*
202-10.36	1.0	sq. foot	Asphalt Removal (Bridges)
202-10.37	1.0	lump sum	Asphalt Removal (Bridges) *Note: Use only with approval of Plans Reviewers.*
202-10.38	1.0	sq. yard	Scarification of Bridge Deck *Note: Do not use on low slump or latex overlays, use for special cases.*
202-10.50	1.0	lump sum	Special Work (Bridges)
202-10.51	1.0	linear foot	Removal and Storage of Existing Bridge Rail
202-10.52	1.0	linear foot	Curb Removal (Bridges)
202-10.53	1.0	linear foot	Curb Removal for Thrie Beam Installation
202-10.54	1.0	linear foot	Replacement of Expansion Device and Adjacent Concrete
202-10.55	1.0	lump sum	Partial Removal of Substructure Concrete
202-99.01	1.0	lump sum	Misc.
202-99.02	1.0	each	Misc.
202-99.03	1.0	linear foot	Misc.
202-99.04	1.0	sq. foot	Misc.
202-99.05	0.10	sq. yard	Misc.
202-99.07	0.10	cu. yard	Misc.
	Indicates this item shall be used only as approved by Review Section.		

Item Number	Accuracy	Units	Item Description
206-10.00	5.0	cu. yard	Class 1 Excavation
206-10.03	1.0	cu. yard	Class 1 Excavation in Rock (*)
206-20.00	1.0	cu. yard	Class 2 Excavation
206-20.03	1.0	cu. yard	Class 2 Excavation in Rock (*)
206-30.00	5.0	cu. yard	Class 3 Excavation
206-31.00	1.0	cu. yard	Class 3 Excavation in Rock (*)
206-36.00	1.0	linear foot	Supplementary Foundation Test Holes (NX)
206-36.10	1.0	linear foot	Supplementary Cored Holes
206-40.00	1.0	cu. yard	Porous Backfill
206-45.00	1.0	cu. yard	Selected Granular Backfill
206-47.00	1.0	cu. yard	Granular Backfill (Culverts-Bridge)
206-47.50	1.0	cu. yard	Granular Backfill (Culverts)
206-55.00	1.0	lump sum	Temporary Shoring
206-60.xx	1.0	lump sum	Cofferdams - Bent xx *Note: Use a separate pay item for each bent. Item numbers established for only Bent 2 thru Bent 12.*
206-99.01	1.0	lump sum	Misc.
206-99.02	1.0	each	Misc.
206-99.03	1.0	linear foot	Misc.
206-99.04	1.0	sq. foot	Misc.
206-99.07	1.0	cu. yard	Misc.
403-10.50	1.0	sq. yard	Alternate Asphaltic Concrete Wearing Surface (Bridge)
407-10.05	10.0	gallon	Tack Coat
409-10.10	10.0	gallon	Polymer Modified Asphalt (Seal Coat)
409-20.92	1.0	ton	Cover Aggregate
503-10.10	1.0	sq. yard	Bridge Approach Slab (Bridge)
605-20.10	1.0	linear foot	Class B Perforated Underdrain
607-10.50	1.0	linear foot	Chain-Link Fence (Retaining Walls)
607-10.54	1.0	linear foot	(42 in.) Property Fence (Structures)
607-10.55	1.0	linear foot	(60 in.) Property Fence (Structures)
607-10.56	1.0	linear foot	(72 in.) Property Fence (Structures)
607-10.57	1.0	linear foot	(84 in.) Property Fence (Structures)
607-10.58	1.0	linear foot	(96 in.) Property Fence (Structures)
607-10.66	1.0	linear foot	(72 in.) Pedestrian Fence (Structures)
607-10.67	1.0	linear foot	(112 in.) Curved Top Pedestrian Fence (Structures)
	Indicates this item shall be used only as approved by Review Section.		

** Note: Use when cross-sections indicate rock will be encountered. (For spread footing, include quantities for key into rock.) If there is less than 10 cu. yards of total excavation in rock, no Excavation in Rock pay items should be listed in the Estimated Quantities (add to the regular excavation or use note B1.10 as per page 2-5 of this section). Check with Project Manager when computing this item.*

Item Number	Accuracy	Units	Item Description
615-10.05	1.0	lump sum	Water Transportation for Engineer
622-10.11	1.0	sq. yard	Cold Milling Bituminous Pavement for Removal of Surface
701-00.00	1.0	each	Supplementary Television Inspection
701-10.12	0.10	linear foot	12 in. Pedestal Pile
701-10.30	0.10	linear foot	30 in. Pedestal Pile
701-10.36	0.10	linear foot	36 in. Pedestal Pile
701-10.42	0.10	linear foot	42 in. Pedestal Pile
701-10.48	0.10	linear foot	48 in. Pedestal Pile
701-10.54	0.10	linear foot	54 in. Pedestal Pile
701-10.60	0.10	linear foot	60 in. Pedestal Pile
701-10.66	0.10	linear foot	66 in. Pedestal Pile
701-10.72	0.10	linear foot	72 in. Pedestal Pile
701-10.84	0.10	linear foot	84 in. Pedestal Pile
701-11.00	0.10	linear foot	Drilled Shafts (1 ft. 0 in. diameter)
701-11.01	0.10	linear foot	Drilled Shafts (1 ft. 6 in. diameter)
701-11.02	0.10	linear foot	Drilled Shafts (2 ft. 0 in. diameter)
701-11.03	0.10	linear foot	Drilled Shafts (2 ft. 6 in. diameter)
701-11.04	0.10	linear foot	Drilled Shafts (3 ft. 0 in. diameter)
701-11.05	0.10	linear foot	Drilled Shafts (3 ft. 6 in. diameter)
701-11.06	0.10	linear foot	Drilled Shafts (4 ft. 0 in. diameter)
701-11.07	0.10	linear foot	Drilled Shafts (4 ft. 6 in. diameter)
701-11.08	0.10	linear foot	Drilled Shafts (5 ft. 0 in. diameter)
701-11.09	0.10	linear foot	Drilled Shafts (5 ft. 6 in. diameter)
701-11.10	0.10	linear foot	Drilled Shafts (6 ft. 0 in. diameter)
701-11.11	0.10	linear foot	Drilled Shafts (6 ft. 6 in. diameter)
701-11.12	0.10	linear foot	Drilled Shafts (7 ft. 0 in. diameter)
701-11.14	0.10	linear foot	Drilled Shafts (8 ft. 0 in. diameter)
701-11.16	0.10	linear foot	Drilled Shafts (9 ft. 0 in. diameter)
701-11.18	0.10	linear foot	Drilled Shafts (10 ft. 0 in. diameter)
	Indicates this item shall be used only as approved by Review Section.		

Item Number	Accuracy	Units	Item Description
701-12.00	0.10	linear foot	Rock Sockets (1 ft. 0 in. diameter)
701-12.01	0.10	linear foot	Rock Sockets (1 ft. 6 in. diameter)
701-12.02	0.10	linear foot	Rock Sockets (2 ft. 0 in. diameter)
701-12.03	0.10	linear foot	Rock Sockets (2 ft. 6 in. diameter)
701-12.04	0.10	linear foot	Rock Sockets (3 ft. 0 in. diameter)
701-12.05	0.10	linear foot	Rock Sockets (3 ft. 6 in. diameter)
701-12.06	0.10	linear foot	Rock Sockets (4 ft. 0 in. diameter)
701-12.07	0.10	linear foot	Rock Sockets (4 ft. 6 in. diameter)
701-12.08	0.10	linear foot	Rock Sockets (5 ft. 0 in. diameter)
701-12.09	0.10	linear foot	Rock Sockets (5 ft. 6 in. diameter)
701-12.10	0.10	linear foot	Rock Sockets (6 ft. 0 in. diameter)
701-12.11	0.10	linear foot	Rock Sockets (6 ft. 6 in. diameter)
701-12.12	0.10	linear foot	Rock Sockets (7 ft. 0 in. diameter)
701-12.13	0.10	linear foot	Rock Sockets (7 ft. 6 in. diameter)
701-12.14	0.10	linear foot	Rock Sockets (8 ft. 0 in. diameter)
701-12.15	0.10	linear foot	Rock Sockets (8 ft. 6 in. diameter)
701-12.16	0.10	linear foot	Rock Sockets (9 ft. 0 in. diameter)
701-12.17	0.10	linear foot	Rock Sockets (9 ft. 6 in. diameter)
701-99.02	1.0	each	Misc.
701-99.03	1.0	linear foot	Misc.
701-99.11	10.0	pound	Misc.
702-10.10	1.0	linear foot	Structural Steel Piles (10 in.)
702-10.12	1.0	linear foot	Structural Steel Piles (12 in.)
702-10.14	1.0	linear foot	Structural Steel Piles (14 in.)
702-11.14	1.0	linear foot	Cast-In-Place Concrete Piles (14 in.)
702-11.20	1.0	linear foot	Cast-In-Place Concrete Piles (20 in.)
702-11.24	1.0	linear foot	Cast-In-Place Concrete Piles (24 in.)
702-12.00	1.0	linear foot	Precast Concrete Piles
702-15.00	1.0	linear foot	Piles *Note:* *Use if precast or CIP piles are permitted on all bents.*
702-16.00	1.0	linear foot	Piles - End Bents Only
702-17.00	1.0	linear foot	Piles - Intermediate Bents Only
702-30.00	1.0	linear foot	Test Piles
702-40.00	1.0	each	Loading Tests
	Indicates this item shall be used only as approved by Review Section.		

Item Number	Accuracy	Units	Item Description
702-60.00	1.0	linear foot	Pre-Bore for Piling *Note: Refer to Std. Spec. Sec. 702.4.3 & 702.4.6 and the Design Layout when computing this item.*
702-70.00	1.0	each	Pile Point Reinforcement
702-99.02	1.0	each	Misc.
702-99.03	1.0	linear foot	Misc.
703-20.00	0.10	cu. yard	Class B Concrete (Culverts-Bridge)
703-20.01	0.10	cu. yard	Class B Concrete (Culverts)
703-20.02	0.10	cu. yard	Class B Concrete (Misc)
703-20.03	0.10	cu. yard	Class B Concrete (Substr)
703-20.09	0.10	cu. yard	Class B Concrete (Retaining Walls)
703-20.10	1.0	sq. foot	Concrete Face Panels *Note: Use for MSE walls.*
703-20.20	1.0	sq. foot	Substructure Repair (Formed)
703-20.21	1.0	sq. foot	Substructure Repair (Unformed)
703-20.22	1.0	sq. foot	Superstructure Repair (Unformed)
703-20.25	1.0	each	Deadman Anchorage Assembly
703-30.00	0.10	cu. yard	Class B Concrete (Seal Course)
703-30.01	0.10	cu. yard	Seal Concrete *Note: Use for seal course.*
703-30.02	0.10	cu. yard	Class B Concrete (Seal Course) (Misc.)
703-30.03	1.0	lump sum	Protective Coating - Concrete Bents (Weathering Steel) *Note: Apply on substructure when using weathering steel.*
703-30.05	1.0	lump sum	Protective Coating - Concrete Bents (Deleterious Agents) *Note: Waterproof substructure concrete under open expansion devices or when specified on Design Layout.*
703-30.06	1.0	lump sum	Masonry Protection System
703-30.07	1.0	lump sum	Graffiti Protection System
703-30.08	1.0	lump sum	Protective Coating for Concrete Bents and Concrete Piers under Expansion Devices
	Indicates this item shall be used only as approved by Review Section.		

Item Number	Accuracy	Units	Item Description
703-40.01	0.10	cu. yard	Class B-1 Concrete
703-40.02	0.10	cu. yard	Class B-1 Concrete (Superstr on Steel and Conc)
703-40.03	0.10	cu. yard	Class B-1 Concrete (Substr)
703-40.04	0.10	cu. yard	Class B-1 Concrete (Superstr on Steel)
703-40.05	0.10	cu. yard	Class B-1 Concrete (Superstr Voided Slabs)
703-40.06	0.10	cu. yard	Class B-1 Concrete (Superstr Conc Box Girder)
703-40.07	0.10	cu. yard	Class B-1 Concrete (Superstr Conc Tee Girder)
703-40.08	0.10	cu. yard	Class B-1 Concrete (Superstr Solid Slab)
703-40.09	0.10	cu. yard	Class B-1 Concrete (Retaining Walls)
703-40.10	0.10	cu. yard	Class B-1 Concrete (Superstr Conc on I Girder)
703-40.20	0.10	cu. yard	Class B-1 Concrete (Superstr)
703-40.30	0.10	cu. yard	Class B-1 Concrete (Barrier Curbs)
703-40.40	0.10	cu. yard	Class B-1 Concrete (Culverts-Bridge)
703-40.41	0.10	cu. yard	Class B-1 Concrete (Culverts)
703-42.02	0.10	cu. yard	Class B-2 Concrete (Superstr on Steel and Concrete)
703-42.04	0.10	cu. yard	Class B-2 Concrete (Superstr on Steel)
703-42.05	0.10	cu. yard	Class B-2 Concrete (Superstr Voided Slabs)
703-42.06	0.10	cu. yard	Class B-2 Concrete (Superstr Conc Box Girder)
703-42.07	0.10	cu. yard	Class B-2 Concrete (Superstr Conc Tee Girder)
703-42.08	0.10	cu. yard	Class B-2 Concrete (Superstr Solid Slab)
703-42.10	0.10	cu. yard	Class B-2 Concrete (Superstr Conc on I Girder)
703-42.11	0.10	cu. yard	Class B-2 Concrete (Superstr Conc on Box Girder)
703-42.12	1.0	sq. yard	Slab on Steel
703-42.13	1.0	sq. yard	Slab on Concrete I-Girder
703-42.14	0.10	cu. yard	Class B-2 Concrete
703-42.15	1.0	linear foot	Safety Barrier Curb
703-42.18	1.0	sq. yard	Slab on Concrete Bulb-Tee Girder
703-42.19	1.0	linear foot	Safety Barrier Curb (Type C)
703-42.20	1.0	sq. yard	Slab on Semi-Deep Abutment
703-42.30	0.10	cu. yard	Class B-2 Concrete (Post -Tensioned Overlay)
703-44.10	1.0	linear foot	Median Barrier Curb
703-44.11	1.0	linear foot	Median Barrier Curb (Type C)
703-44.12	1.0	linear foot	Median Barrier Curb Transition
703-44.13	1.0	linear foot	Median Barrier Curb Transition (Type C)
703-44.20	1.0	sq. foot	Raised Median Barrier
703-44.30	1.0	sq. foot	Sidewalk (Bridges)
	Indicates this item shall be used only as approved by Review Section.		

Item Number	Accuracy	Units	Item Description
703-45.10	1.0	linear foot	Precast Safety Barrier Curb
703-45.11	1.0	linear foot	Precast Barrier Curb with Overhang
703-45.25	1.0	linear foot	Bridge Rail or Barrier Curb
703-45.35	1.0	linear foot	Curb Modification
703-46.00	1.0	linear foot	Curb Blockout
703-50.10	50 (*)	sq. foot	Repairing Concrete Deck (Half-Soling)
703-50.20	50 (*)	sq. foot	Full Depth Repair
703-50.30	1.0	linear foot	Slab Edge Repair (Bridges)
703-50.31	1.0	linear foot	Slab Overhang Replacement
703-50.40	50 (*)	sq. foot	Modified Deck Repair
703-60.00	0.10	cu. yard	Class A-1 or Class X Concrete
703-70.20	1.0	lump sum	Prestressed Concrete Superstructure
703-70.23	1.0	sq. yard	Epoxy Polymer Concrete Overlay
703-70.24	1.0	sq. yard	Class B-2 Concrete
703.70.25	1.0	sq. yard	Concrete Wearing Surface
703-70.27	1.0	sq. yard	Silica Fume Concrete Wearing Surface
703-70.28A	1.0	sq. yard	Latex Modified Concrete Wearing Surface
703-70.29	1.0	sq. yard	Low Slump Concrete Wearing Surface
703-70.30	1.0	each	Plain Neoprene Bearing Pad
703-70.40	1.0	linear foot	Plain Neoprene Bearing Pad
703-71.45	1.0	each	Laminated Neoprene Bearing Pad
703-71.50	1.0	each	Laminated Neoprene Bearing Pad (Tapered)
703-71.60	1.0	each	Laminated Neoprene Bearing Pad (Steel Structures)
703-71.65	1.0	each	Laminated Neoprene Bearing Pad (P/S Structures)
703-72.50	1.0	each	Type N PTFE Bearings
703-72.70	1.0	each	Pot Bearings
	Indicates this item shall be used only as approved by Review Section.		
* Note: Round quantity up to nearest multiple of 50. (Example: round 51 sq. ft. to 100 sq. ft.)			

Item Number	Accuracy	Units	Item Description
703-82.15	1.0	linear foot	Preformed Compression Expansion Joint Seal (1.25 in.)
703-82.17	1.0	linear foot	Preformed Compression Expansion Joint Seal (1-5/8 in.)
703-82.20	1.0	linear foot	Preformed Compression Expansion Joint Seal (2.0 in.)
703-82.25	1.0	linear foot	Preformed Compression Expansion Joint Seal (2.5 in.)
703-82.30	1.0	linear foot	Preformed Compression Expansion Joint Seal (3.0 in.)
703-82.35	1.0	linear foot	Preformed Compression Expansion Joint Seal (3.5 in.)
703-82.40	1.0	linear foot	Preformed Compression Expansion Joint Seal (4.0 in.)
703-82.45	1.0	linear foot	Preformed Compression Expansion Joint Seal (4.5 in.)
703-82.50	1.0	linear foot	Preformed Compression Expansion Joint Seal (5.0 in.)
703-85.00	1.0	linear foot	Strip Seal Expansion Device
703-85.10	1.0	linear foot	Strip Seal Expansion Joint System
703-85.15	1.0	linear foot	Alternate Expansion Joint System
703-85.20	1.0	linear foot	Modification of Existing Expansion Joint
703-85.25	1.0	linear foot	Dow Corning/SSI XJS Expansion Joint System
703-98.98	1.0	sq. foot	Special Item - Repair Girder Ends (Unformed)
703-99.01	1.0	lump sum	Misc.
703-99.02	1.0	each	Misc.
703-99.03	1.0	linear foot	Misc.
703-99.04	1.0	sq. foot	Misc.
703-99.05	0.1	sq. yard	Misc.
703-99.07	0.1	cu. yard	Misc.
704-10.00	0.1	cu. yard	Class X Concrete *Note: Use when specified on the Design Layout.*
705-10.10	1.0	sq. foot	Precast Prestressed Concrete Panels
705-10.30	1.0	lump sum	Post-Tension System
705-10.40	1.0	each	Shear Key (Post-Tension)
	Indicates this item shall be used only as approved by Review Section.		

Item Number	Accuracy	Units	Item Description
705-11.xx	1.0	each	Prestressed Concrete I-Girder (xx ft Span) *Note: 25 ft span thru 99 ft span.*
705-12.00	1.0	each	Prestressed Concrete I-Girder (100 ft Span)
705-14.xx	1.0	each	Prestressed Concrete Box Girder (xx ft Span) *Note: 30 ft span thru 80 ft span.*
705-16.xx	1.0	each	Prestressed Concrete Bulb Tee Girder (xx ft Span) *Note: 75 ft span thru 99 ft span.*
705-17.xx	1.0	each	Prestressed Concrete Bulb Tee Girder (1xx ft Span) *Note: 100 ft span thru 130 ft span.*
705-20.xx	1.0	each	Prestressed Concrete Double Tee Girder (xx ft Span) *Note: 25 ft span thru 60 ft span.*
705-30.00	1.0	linear foot	Prestressed Precast Concrete I-Girder (Post-Tensioned) (54 in.)
705-40.00	1.0	linear foot	Precast Concrete I-Girder (Post-Tensioned) (54 in.)
705-50.00	1.0	linear foot	Prestressed Barrier Curb with Overhang *Note: Use on prestressed double-tee spans.*
705-99.01	1.0	lump sum	Misc.
705-99.02	1.0	each	Misc.
706-10.00	10	pound	Reinforcing Steel
706-10.20	10	pound	Reinforcing Steel (Culverts-Bridge)
706-10.30	10	pound	Reinforcing Steel (Culverts)
706-10.40	10	pound	Reinforcing Steel (Retaining Wall)
706-10.60	10	pound	Reinforcing Steel (Bridges)
706-10.70	1.0	each	Mechanical Bar Splice
706-99.11	1.0	pound	Misc.
707-10.00	1.0	lump sum	Conduit System on Structure
707-10.10	1.0	lump sum	Bridge Lighting
707-10.20	1.0	lump sum	Navigation Lighting System
707-10.30	1.0	lump sum	Conduit System on Structure (Telephone)
707-10.40	1.0	lump sum	Cathodic Protection System
707-99.01	1.0	lump sum	Misc.
707-99.02	1.0	each	Misc.
710-10.00	10	pound	Reinforcing Steel (Epoxy Coated)
	Indicates this item shall be used only as approved by Review Section.		

Item Number	Accuracy	Units	Item Description
712-09.00	1.0	linear foot	Expansion Device (Finger Plate)
712-09.10	1.0	lump sum	Expansion Device (Finger Plate)
712-09.15	1.0	linear foot	Expansion Device (Flat Plate)
712-10.00	10	pound	Fabricated Structural Carbon Steel (Misc.)
712-10.10	10	pound	Fabricated Structural Carbon Steel (I-Beam)
712-10.20	10	pound	Fabricated Structural Carbon Steel (Plate Girders)
712-10.30	10	pound	Fabricated Structural Carbon Steel (Trusses)
712-10.40	10	pound	Fabricated Structural Carbon Steel (Concrete)
712-10.50	10	pound	Fabricated Structural Carbon Steel (Box Girders)
712-10.60	1.0	lump sum	Fabricated Sign Support Brackets
712-11.00	10	pound	Fabricated Structural Low Alloy Steel (Misc.)
712-11.11	10	pound	Fabricated Structural Low Alloy Steel (I-Beam) ASTM A709 Grade 50
712-11.13	10	pound	Fabricated Structural Low Alloy Steel (I-Beam) ASTM A709 Grade 50W
712-11.21	10	pound	Fabricated Structural Low Alloy Steel (Plate Girders) ASTM A709 Grade 50
712-11.22	10	pound	Fabricated Structural Low Alloy Steel (Plate Girders) ASTM A709 Grade 50W
712-11.23	10	pound	Fabricated Structural Low Alloy Steel (Plate Girders) ASTM A709 Grade HPS70W
712-11.30	10	pound	Fabricated Structural Low Alloy Steel (Trusses)
712-11.40	10	pound	Fabricated Structural Low Alloy Steel (Concrete)
712-11.51	10	pound	Fabricated Structural Low Alloy Steel (Box Girders) ASTM A709 Grade 50
712-11.52	10	pound	Fabricated Structural Low Alloy Steel (Box Girders) ASTM A709 Grade 50W
712-11.60	1.0	sq. foot	Steel Grid Floor (Half Concrete Filled)
712-11.61	1.0	sq. foot	Steel Grid Floor (Concrete Filled)
712-12.50	1.0	lump sum	Strengthening Existing Stringers
712-13.00	10	pound	Fabricated Structural Steel Bearings
712-20.00	10	pound	Carbon Steel Castings
712-22.00	10	pound	Gray Iron Castings
712-23.00	1.0	linear foot	Bridge Rail (Two Tube Structural Steel)
712-30.00	1.0	each	Steel Bar Dam
	Indicates this item shall be used only as approved by Review Section.		

Item Number	Accuracy	Units	Item Description
712-31.00	1.0	each	Cleaning and Coating Existing Bearings
712-31.10	1.0	each	Bearing Removal for Inspection
712-31.15	1.0	each	Surface Finishing Bearing Rocker
712-31.20	1.0	each	Cleaning, Lubricating and Coating Bearing
712-31.30	1.0	each	Rehabilitate Bearing
712-31.40	10	pound	New Bearing Materials
712-31.50	1.0	each	Anchor Bolt Replacement
712-32.00	1.0	each	Removing, Coating, and Reinstalling Light Standards (Bridges)
712-32.10	1.0	each	Earth Quake Restrainer Assemblies
712-33.00	1.0	lump sum	Existing Diaphragm Connections to Flange
712-35.00	1.0	linear foot	Railing for Steps
712-36.10	1.0	each	Slab Drain
712-36.11	1.0	each	Slab Drain with Grate
712-36.20	1.0	lump sum	Drainage System (On Structure)
712-40.00	0.10	ton	Painting
712-50.00	0.10	ton	Painting (2 Coats)
712-50.15	1.0	lump sum	Painting (Existing and New Steel)
712-50.30	1.0	lump sum	Repainting Existing Steel
712-51.00	1.0	lump sum	Surface Preparation for Recoating Structural Steel
712-51.10	1.0	lump sum	Field Application of Inorganic Zinc Primer
712-52.00	100.00	sq. foot	Surface Preparation for Recoating Structural Steel
712-52.10	100.00	sq. foot	Field Application of Inorganic Zinc Primer
712-53.10	0.10	ton	Field Coat (System G) Gray
712-53.15	0.10	ton	Intermediate Field Coat (System G) Gray
712-53.20	0.10	ton	Finish Field Coat (System G) Gray
712-53.25	0.10	ton	Intermediate Field Coat (System G) Brown
712-53.30	0.10	ton	Finish Field Coat (System G) Brown
712-53.35	0.10	ton	Intermediate Field Coat (System H) Gray
712-53.40	0.10	ton	Finish Field Coat (System H) Gray
712-53.45	0.10	ton	Intermediate Field Coat (System H) Brown
712-53.55	0.10	ton	Finish Field Coat (System H) Brown
712-53.60	0.10	ton	Field Coat (System H) Gray
	Indicates this item shall be used only as approved by Review Section.		

Item Number	Accuracy	Units	Item Description
712-53.65	100.00	sq. foot	Intermediate Field Coat (System G) Gray
712-53.70	100.00	sq. foot	Finish Field Coat (System G) Gray
712-53.75	100.00	sq. foot	Intermediate Field Coat (System G) Brown
712-53.80	100.00	sq. foot	Finish Field Coat (System G) Brown
712-53.85	100.00	sq. foot	Intermediate Field Coat (System H) Gray
712-53.90	100.00	sq. foot	Finish Field Coat (System H) Gray
712-53.95	100.00	sq. foot	Intermediate Field Coat (System H) Brown
712-54.05	100.00	sq. foot	Finish Field Coat (System H) Brown
712-54.10	100.00	sq. foot	Field Coat (System G) Gray
712-54.60	100.00	sq. foot	Field Coat (System H) Gray
712-55.00	1.0	lump sum	Transporting Sandblast Residue
712-55.10	1.0	lump sum	Transporting Lead Contaminated Residue to Storage Area
712-55.20	1.0	lump sum	Transporting Lead Contaminated Residue to the Smelter
712-56.00	1.0	lump sum	Disposal of Lead Contaminated Residue
712-60.00	1.0	linear foot	Non-Destructive Testing
712-99.01	1.0	lump sum	Misc.
712-99.02	1.0	each	Misc.
712-99.03	1.0	linear foot	Misc.
712-99.04	0.1	sq. foot	Misc.
712-99.05	0.1	sq. yard	Misc.
712-99.10	0.1	ton	Misc.
712-99.11	0.1	pound	Misc.
713-30.00	1.0	linear foot	Bridge Guard Rail (W-Beam)
713-40.00	1.0	linear foot	Bridge Guard Rail (Thrie Beam)
713-99.03	1.0	linear foot	Misc.
714-20.00	1.0	linear foot	High Str Bridge Rail (One Tube)
714-30.00	1.0	linear foot	High Str Bridge Rail (Two Tube)
714-50.00	1.0	lump sum	Bridge Rail Relocated
715-10.01	1.0	each	Vertical Drain at End Bents
718-10.10	1.0	lump sum	Furnishing Superstructure
718-10.11	1.0	lump sum	Partial Furnishing of Superstructure
718-10.20	1.0	lump sum	Erecting Superstructure
718-10.30	1.0	lump sum	Removing and Storing Superstructure
	Indicates this item shall be used only as approved by Review Section.		

2.5.2 Computation of Estimated Quantities

General

All estimated quantities shall be carried to the degree of accuracy specified in the Index of Estimated Quantities. All quantities shall be listed on the plans in the order and worded exactly as shown in the Index of Estimated Quantities.

Two sets of quantity computations shall be independently performed and then agreed upon by the individuals performing the computations. Both sets of computations shall be bound together and submitted with the design plans.

In order to satisfy funding requirements on projects that add capacity to the Interstate System, the quantities that are attributed to the addition of capacity shall be reported separately from the remaining quantities in the submitted computations. Quantities shall not be shown separately on the bridge plans.

Weight of Bolts

Refer to AISC Manual of Steel Construction or ASTM A325 for weight and dimensions of high strength bolts and washers. When calculating the weight of high strength bolts in structural connections, the following simplified weights may be used. These values include the weight of a regular hex head, one heavy hex nut, one washer, and the portion of the bolt projecting beyond the grip (washer thickness + nut thickness + 1/4“).

Bolt Size Diameter (inch)	Weight per 100 Bolts (pounds)
5/8	40
3/4	65
7/8	95
1	135
1-1/8	180
1-1/4	245
1-3/8	352
1-1/2	400

Table 2.5.2-1 Weight of High Strength Bolts

Piles

Estimated quantities for piles, steel or concrete, shall be compiled as the entire length of the piles used including the length of pile embedded in the pile cap or footing measured to the nearest foot for each pile.

Pre-bore for Piling

Pre-bore is required when fill exceeds five feet as described in Section 702.4.3 of the Missouri Standard Specifications or when specified on the Design Layout. Pre-bore is also required through earth plugs. Pre-bore is computed as the length of pile measured from the bottom of the pile cap or footing to the natural ground line or as directed on the Design Layout rounded to the nearest foot for each hole.

Concrete

The volume of concrete shall be calculated to the nearest 0.1 cubic yard. Do not deduct for volume of concrete displaced by reinforcing steel or piling.

Non-Destructive Testing

The length of weld requiring non-destructive testing shall include 6” of weld along each edge of the cover plate and the 1” returns along the end of the cover plate at each corner. On tapered ends, test weld along the end of cover plate, along tapered edges and 6” back along cover plate from end of taper.

Temporary Shoring

When temporary shoring is required, it shall be reported as a lump sum item on the bridge plans. In addition, the estimated area of temporary shoring shall be computed to the nearest square foot and recorded only in the quantity folder. Embedment of temporary shoring shall be taken as one third of the exposed height of the shoring for the purpose of estimating the shoring area.

MSE Retaining Walls

MSE Wall quantities are to be calculated based on the area of the vertical face of the wall as shown on the plans.

The payment for furnishing and fabricating all materials for the walls, including concrete facing panels, excavation for leveling pad, reinforcement, joint materials, selected granular backfill and other incidentals, shall be considered as completely covered under the contract unit price for Concrete Face Panels, per square foot. The use of the Selected Granular Backfill (pay item 206-45.00) is not required.

Structural Steel Protective Coatings (Non-Weathering Steel)

The protective coating, as specified on the Design Layout, shall be System G or H with the color being gray or brown. The coating color shall be specified on the Design Layout. The following gives pay item guidelines for most bridges.

New Multi-Girder/Stringer Bridges

Intermediate Field Coat and Finish Field Coat (System G & H) (Gray or Brown) - The quantity shall be computed to the nearest one hundred square foot of structural steel to be field coated.

1. Bridges over Roadways (does not include over Railroads)

The intermediate field coat for beam and girder spans shall be applied to the surfaces of all structural steel except those surfaces to be in contact with concrete shall not receive the intermediate coat. The intermediate coat shall also be applied to the bearings, except where bearings will be encased in concrete.

The finish field coat for beam and girder spans shall include the facia girders or beams. The limits of the facia girders or beams shall include the bottom of the top exterior flanges, the top of the bottom exterior flanges, the exterior web area, the exterior face of the top and bottom flanges, and the bottom of the bottom flange. Areas of steel to be in contact with concrete shall not receive the finish coat. The finish coat shall also be applied to the exterior bearings, except where bearings will be encased in concrete.

The surfaces of all structural steel located under expansion joints of beam and girder spans shall be field coated with intermediate and finish coats for a distance of **1-1/2** times the girder depth, but not less than **10** feet from the center line of the joint. Within this limit, the items to be field coated shall include all surfaces of beams, girders, bearings, diaphragms, stiffeners and miscellaneous structural steel items. Areas of steel to be in contact with concrete shall not receive the field coats. The limits of the field coatings shall be masked to provide crisp, straight lines and to prevent overspray on adjacent areas.

2. Bridges over Streams and Bridges over Railroads

The field coating (including intermediate and finish coats) for beam and girder spans shall include the facia girders or beams. The limits of the facia girders or beams shall include the bottom of the top exterior flanges, the top of the bottom exterior flanges, the exterior web area, the exterior face of the top and bottom flanges, and the bottom of the bottom flange. Areas of steel to be in contact with concrete shall not receive the field coats. The field coating shall also be applied to the exterior bearings, except where bearings will be encased in concrete. The interior beams or girders shall only have the prime coat applied with no other field coating required.

The surfaces of all structural steel located under expansion joints of beam and girder spans shall be field coated with intermediate and finish coats for a

distance of **1-1/2** times the girder depth, but not less than **10** feet from the center line of the joint. Within the limit, the items to be field coated shall include all surfaces of beams, girders, bearings, diaphragms, stiffeners and miscellaneous structural steel items. Areas of steel to be in contact with concrete shall not receive the field coats. The limits of the field coatings shall be masked to provide crisp, straight lines and to prevent overspray on adjacent areas.

New Truss Bridges or Other Unusual Structures

Intermediate Field Coat and Finish Field Coat (System G or H) (Gray or brown) - The quantity shall be computed to the nearest **0.1** ton of plan quantity of structural steel.

All structural steel for truss or steel box girder spans shall be field coated with intermediate and finish coats, except the area of steel to be in contact with concrete.

Existing Multi-Girder/Stringer Bridges

1. Surface Preparation for Recoating Structural Steel - The quantity shall be computed to the nearest one hundred square foot of structural steel to be prepared. The area computations do not include diaphragms, stiffeners and all other misc. steel within the limits of preparation. If the deck is removed, the top of the top flange shall be included in the area computations.
2. Field Application of Inorganic Zinc Primer - The quantity shall be computed with the same requirements of Surface Preparation for Recoating Structural Steel.
3. Intermediate Field Coat (System G or H) (Gray or Brown) - The quantity shall be computed with the same requirements of a new multi-girder bridge.
4. Finish Field Coat (System G or H) (Gray or Brown) - The quantity shall be computed with the same requirements of a new multi-girder bridge.

Existing Truss Bridges or other Unusual Structures

1. Surface Preparation for Recoating Structural Steel - The quantity shall be computed as a **lump sum** quantity. The approximate weight of steel shall be shown to the nearest ton on the plan sheet.
2. Field Application of Inorganic Zinc Primer – The quantity shall be computed as a **lump sum** quantity. The approximate weight of steel shall be shown to the nearest ton on the plan sheet.
3. Intermediate Field Coat (System G or H) (Gray or Brown) – The quantity shall be computed with the same requirements as a new truss bridge.
4. Finish Field Coat (System G or H) (Gray or Brown) – The quantity shall be computed with the same requirements as a new truss bridge.

Structural Steel Protective Coatings (Weathering Steel)

There will not be a quantity item for coating weathering steel. The cost of coating weathering steel structures shall be included in the contract unit price of the Fabricated Structural Steel.

Protective Coatings for Concrete Bents

When the use of a protective coating for concrete bents is required**,** it shall be reported as a lump sum item on the bridge plans. In addition, the estimated area to be coated shall be computed to the nearest square foot and recorded only in the quantity folder. The following guidelines shall apply to the calculations for these items.

Protective Coating - Concrete Bents
(Deleterious Agents)
See *Expansion Devices Section* for details.

Protective Coating - Concrete Bents
(Weathering Steel)
Concrete Abutments - Coat all surfaces above the ground line.

Concrete Intermediate Bents - Coat all surfaces above the ground line or above the low water elevation, whichever is the higher at that bent.

Asphaltic Concrete Pavement

The following unit weights shall be used to calculate the quantities reported in the Estimated Quantities for Alternate Asphaltic Concrete Wearing Surface quantities box.

Type SP125HBSM (Stone Mastic Asphalt) Concrete Mix
Asphalt Binder = 0.126 ton/cu. yd.
Mineral Aggregate = 1.879 ton/cu. yd.
SMA Fibers= 12.4 lbs./cu. yd.

Type SP125MCSM (Stone Mastic Asphalt) Concrete Mix
Asphalt Binder = 0.126 ton/cu. yd.
Mineral Aggregate = 1.879 ton/cu. yd.
SMA Fibers= 12.4 lbs./cu. yd.

Type SP125HBLP (Limestone/Porphyry Asphalt) Concrete Mix
Asphalt Binder = 0.114 ton/cu yd.
Mineral Aggregate = 1.856 ton/cu. yd.

Type SP125MCLP (Limestone/Porphyry Asphalt) Concrete Mix
Asphalt Binder = 0.114 ton/cu yd.
Mineral Aggregate = 1.856 ton/cu. yd.

Seal Coat

A seal coat shall be used when penetration seal is specified on the Design Layout. The following unit weights shall be used to calculate the quantities reported on the bridge plans.

Polymer Modified Asphalt = 0.35 gal/sq. yd.
Cover Aggregate = 0.0125 ton/sq. yd.

Tack Coat

A tack coat shall be used when specified on the Design Layout. The following unit weights shall be used to calculate the quantities reported on the bridge plans.

Tack Coat = 0.05 gal/sq. yd.

Excavation

Excavation shall be computed in accordance with Missouri Standard Specifications Sections 206.5.1, 206.5.2, 206.5.3 and the limits shown in this section.

The **Roadway and Drainage Excavation Line** is the finish grade line after the bridge is completed in place. This may or may not correspond to the preliminary embankment line placed before the bridge is built.

The **Excavation Datum** is located at one foot above Low Water Elevation of the steam bed (round up to the next 0.1 foot). Use the low point of the streambed cross-section as Low Water Elevation, if a Low Water Elevation can not be found.

Excavation Limit Rules

Soil or other sub-strata shall be excavated to the limits of:

- 18" around the perimeter at the bottom of footings, and vertically (*) to the finished Roadway and Drainage Excavation Line
- 18" under and around the wings on end bents
- No excavation below sidewalls or wings of a semi-deep abutment
- The perimeter of seal courses
- No excavation shall be figured for piles or bracing
- If there is less than 10 cubic yards of total excavation, no excavation item needs to be listed in the Estimated Quantities. See note B1.10 in the *Office Notes* section.

Classes of Excavation (**)

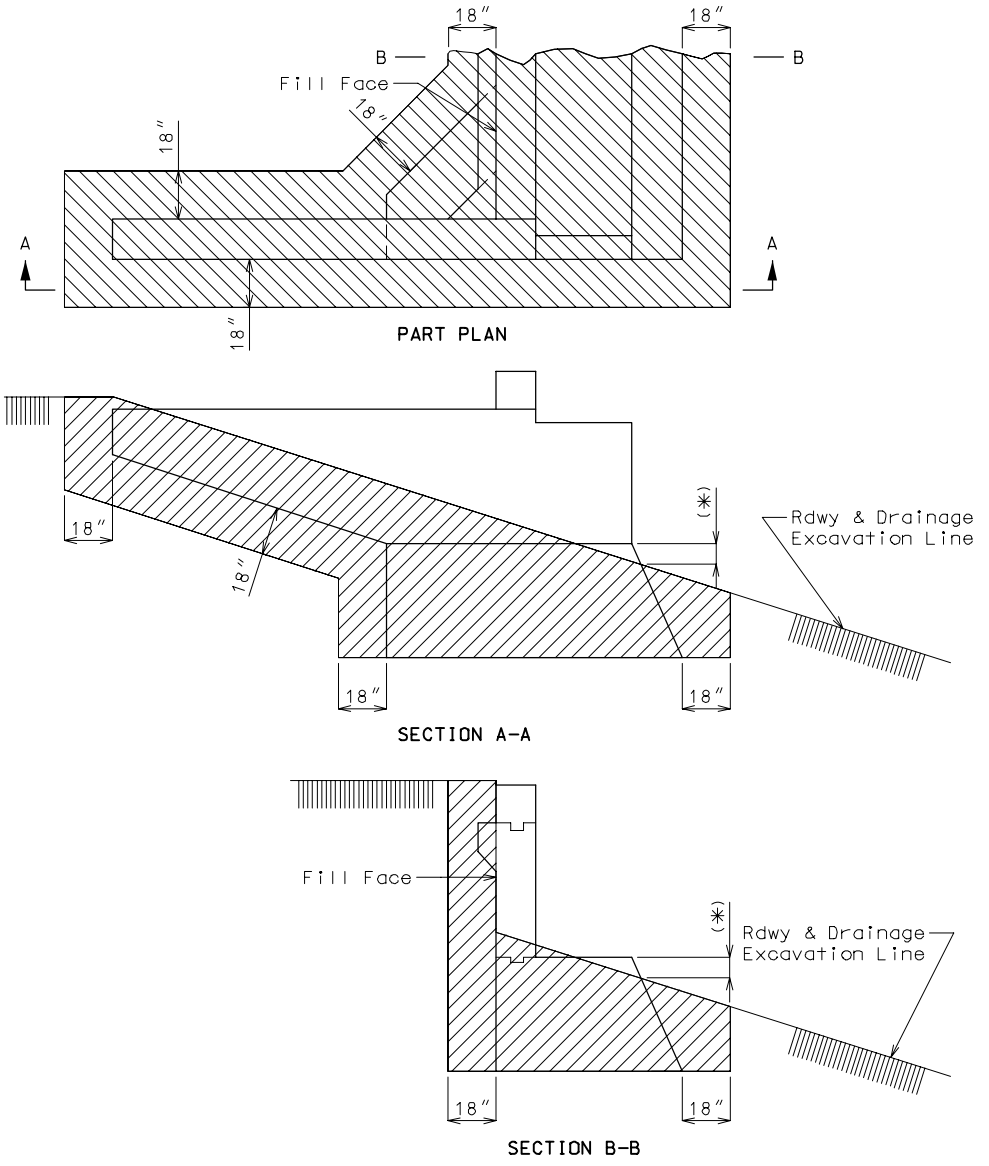
Class 1, Class 2 Excavations shall be computed in accordance with Missouri Standard Specifications Sections 206.5.1, 206.5.2, 206.5.3 and the limits shown in Figure 2.5.2-1 to Figure 2.5.2-8.
Excavation for structures below *Excavation Datum Elevation* will be paid for as ***Class 2 Excavation.***
Excavation for structures above *Excavation Datum Elevation* will be paid for as ***Class 1 Excavation.*** Use a minimum of 10 cubic yards of Class 1 Excavation when there is Class 2.

Class 3 Excavation shall be used for culverts. Class 3 Excavation shall be computed in accordance with Missouri Standard Specifications Section 206.5.2 and the limits shown in the *Culverts* section of the Bridge Manual.
Culvert concrete removal for extensions shall be paid for as Partial Removal of Culvert Concrete (Bridges). See the Design Layout for special cases.

Cases of Excavation

Case 1 is when the ground line survey is a higher elevation than the roadway and drainage excavation line.
Case 2 is when the ground line survey is a lower elevation than the roadway and drainage excavation line.

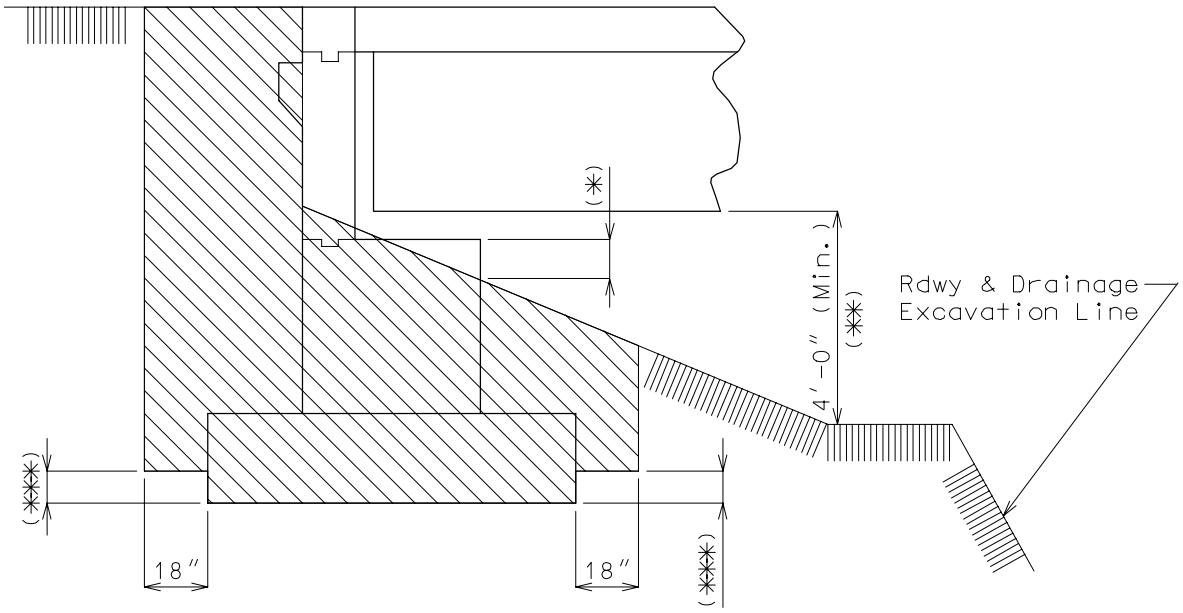
(*) Soil shall be excavated vertically from the bottom of the footing for footing on pile, 6" above the bottom of the footing for footing on rock and 18" above the bottom of the footing for footing on shale.
(**) Use Excavation in Rock if it is anticipated. The designer should check with the Structural Project Manager before calculating the quantity of Excavation in Rock. See page 1-2 of this section.



✳ 12″ at lowest beam depth for Girder Bridges and 24″ for Concrete Slab Bridges.

Figure 2.5.2-1 Non-Integral End Bent Excavation Limits (Case 1 ✳✳)

✳✳ Case 1 is when the ground line survey is a higher elevation than the roadway and drainage excavation line.



* 12" at lowest beam depth for girder bridges and 24" for concrete slab bridges.
** Specify berm elevation or 4'-0" minimum clearance.
*** 6" for footing on rock, 18" for footing on shale.

When calculating rock excavations allow 18" around and 6" underneath wing. Use the following note on plans:

Note: Bottom of wings at End Bents No.___ and ___ shall not be cast on rock.

Figure 2.5.2-2 Stub Bent Excavation Limits (Case 1 ****)

**** Case 1 is when the ground line survey is a higher elevation than the roadway and drainage excavation line.

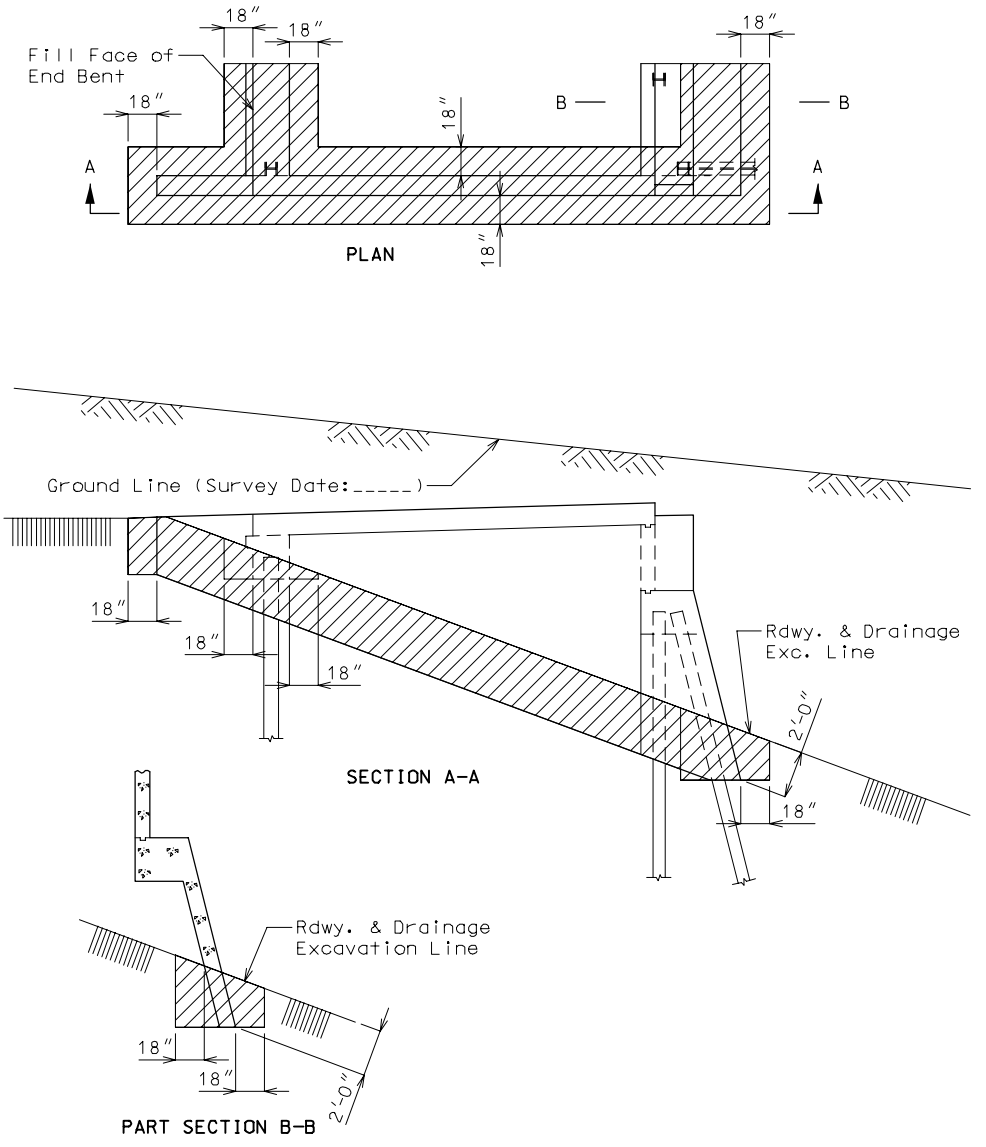


Figure 2.5.2-3 Semi-Deep Abutment Excavation Limits (Case 1 ✳)

✳ Case 1 is when the ground line survey is a higher elevation than the roadway and drainage excavation line.

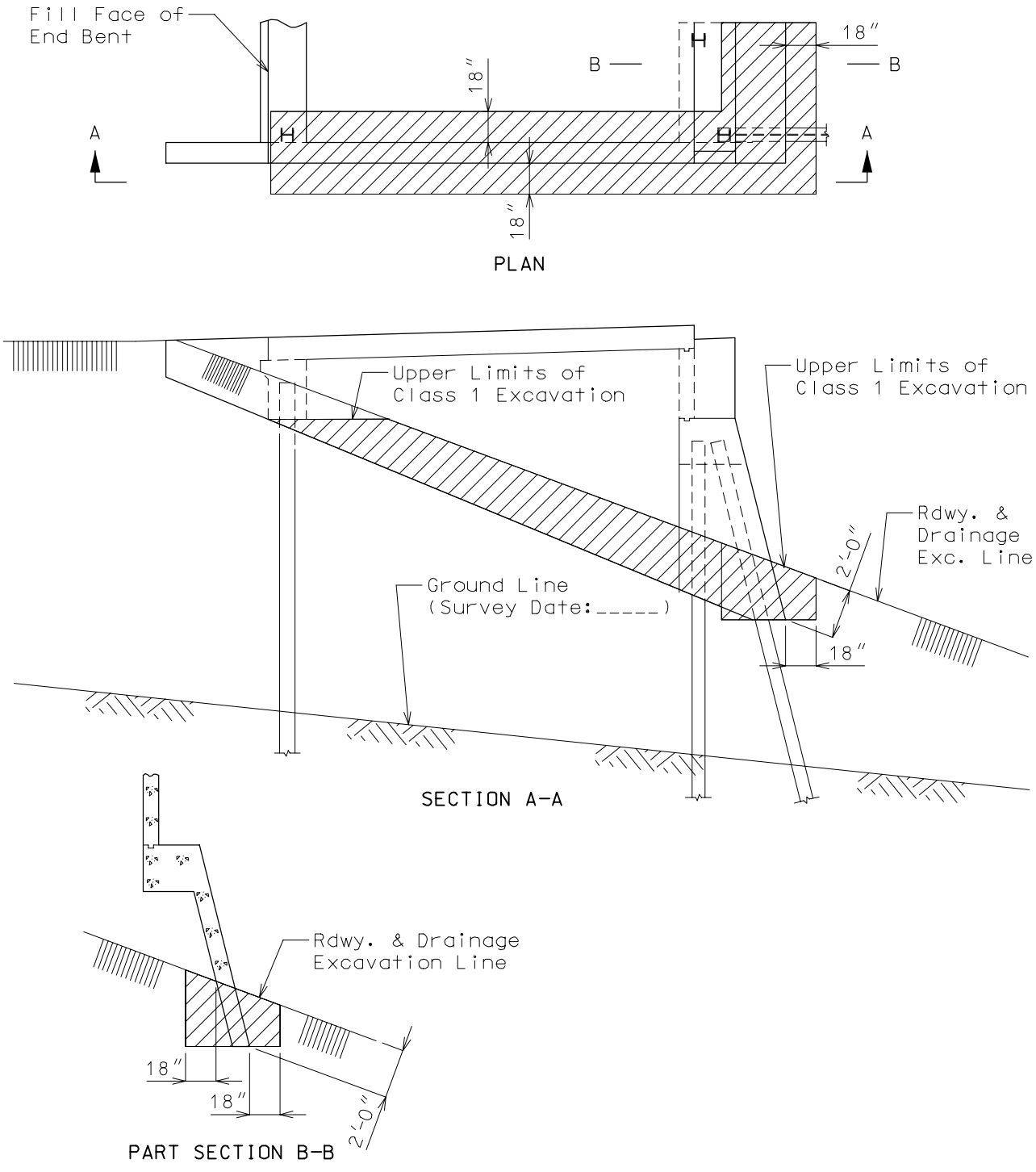


Figure 2.5.2-4 Semi-Deep Abutment Excavation Limits (Case 2 ✳)

✳ Case 2 is when the ground line survey is a lower elevation than the roadway and drainage excavation line.

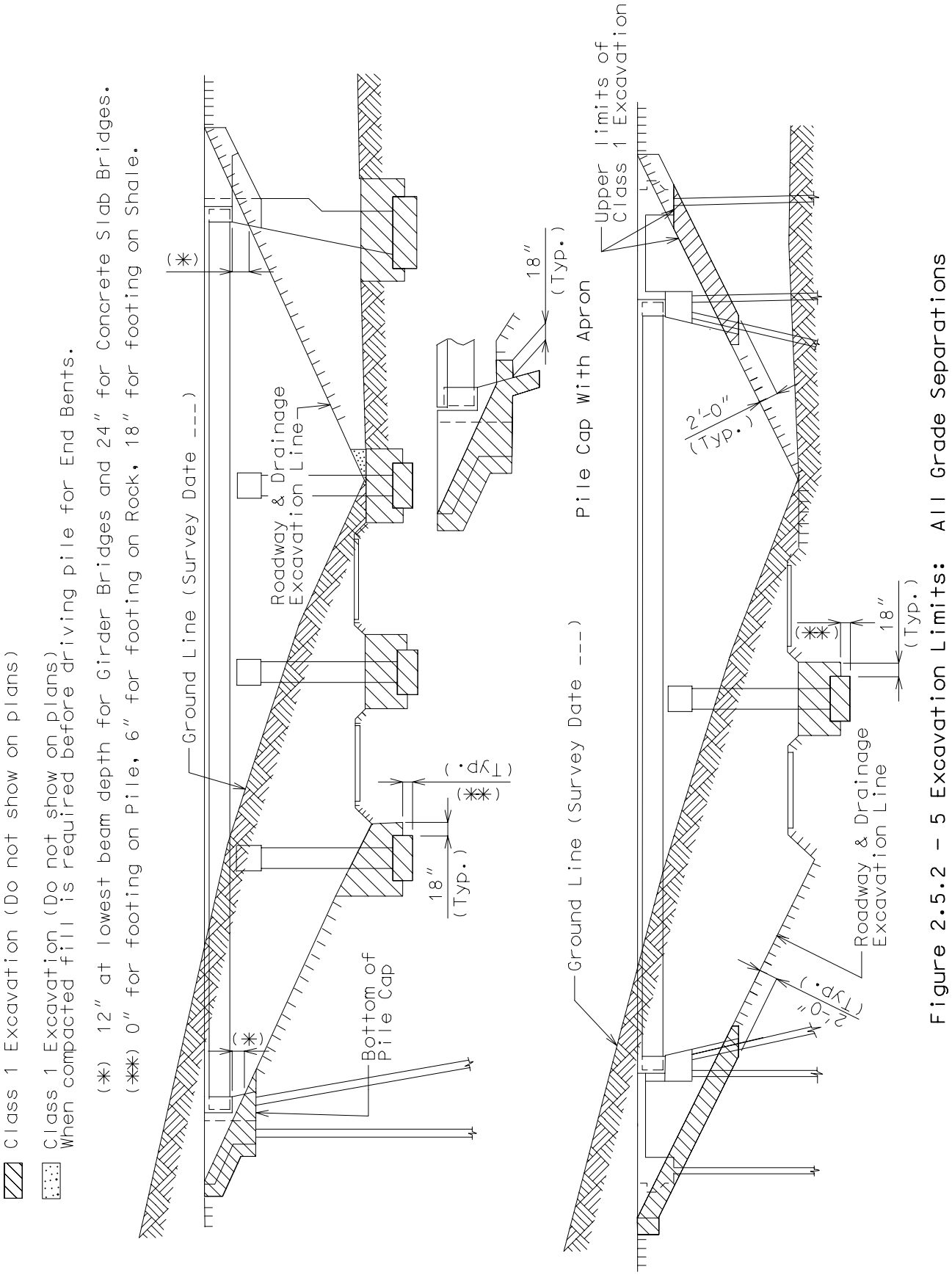


Figure 2.5.2 - 5 Excavation Limits: All Grade Separations

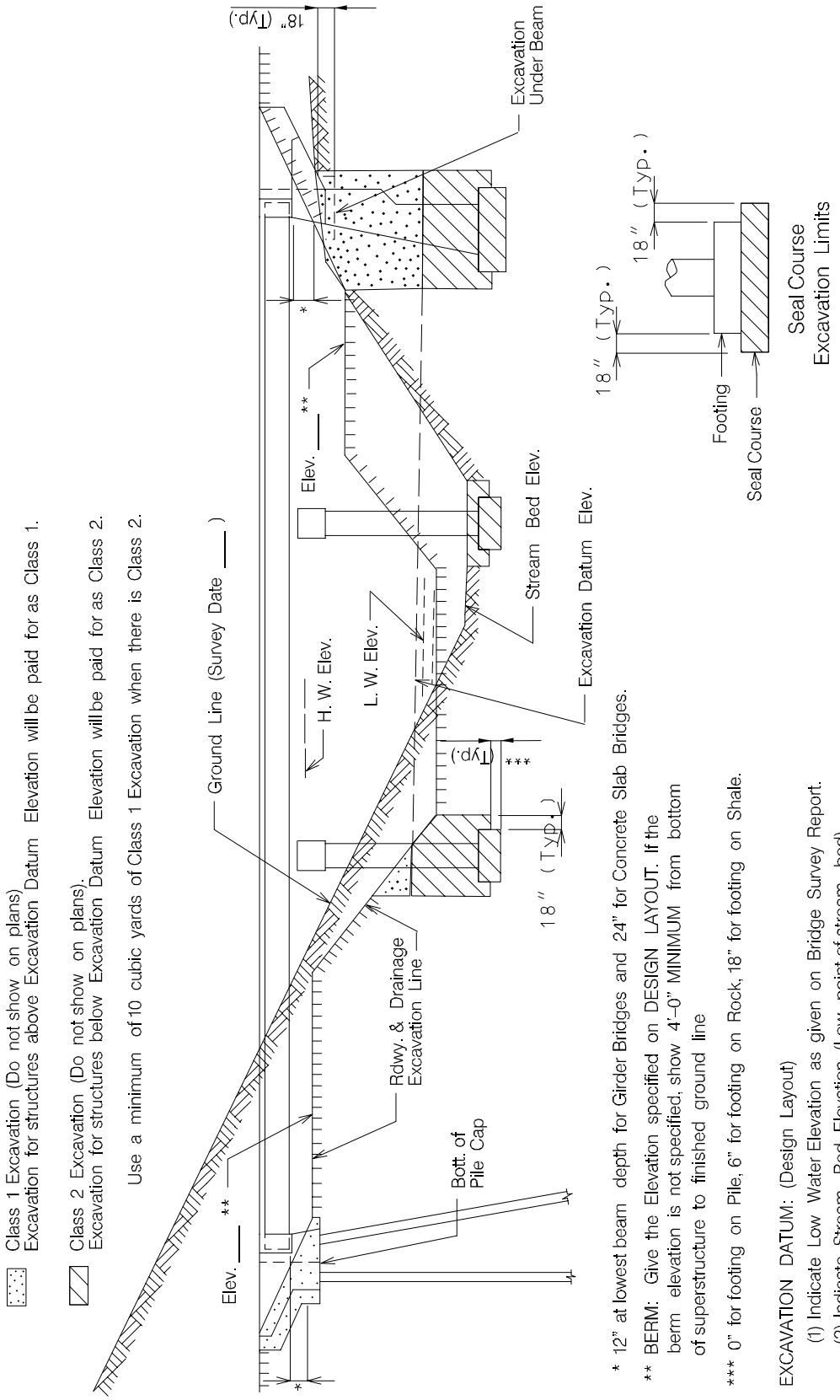


Figure 2.5.2 - 6 Excavation Limits: Stream Crossings (Typical)

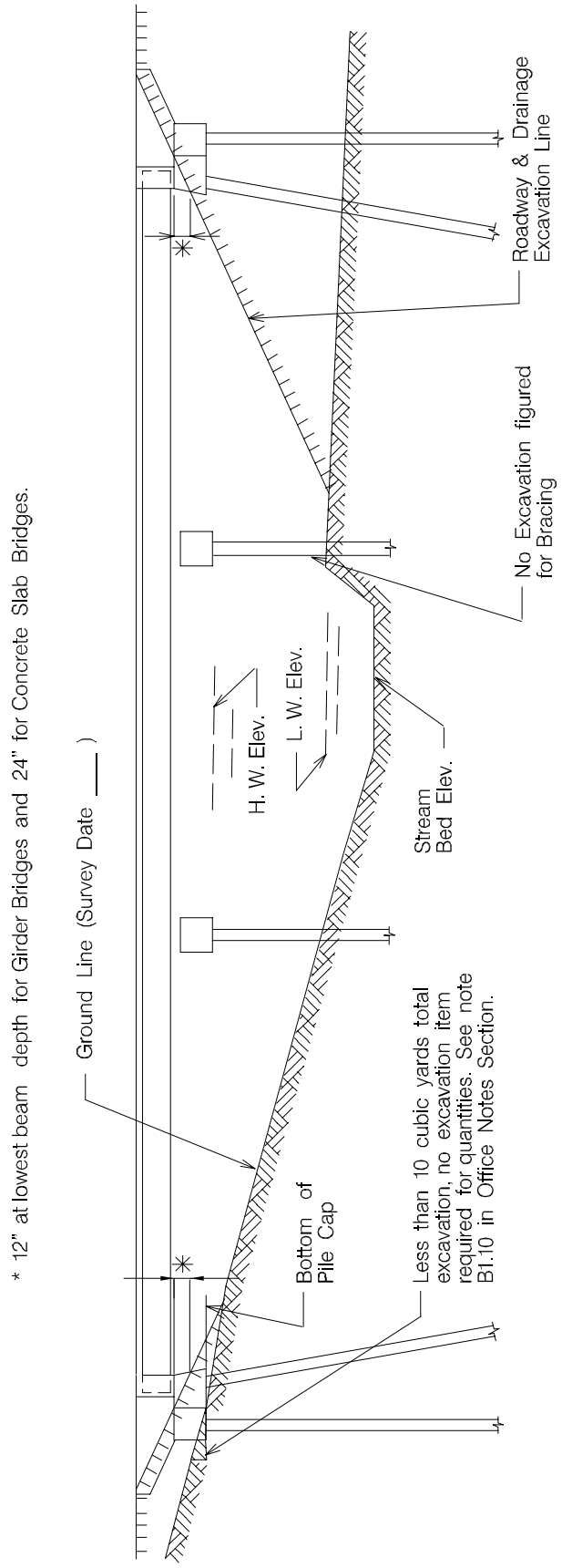


Figure 2.5.2-7 Excavation Limits: Stream Crossing (No Excavation Item)

Note: Excavation to be included in Estimated Quantity Table (Class 1 or Class 3 Excavation shall be carriered to the nearest 5 cubic yards). Final limits of the roadway and bridge excavation to be coordinated with the bridge plans prior to estimating.

See Manual Section 4 for the appropriate notes.

Figure 2.5.2–8 Excavation Limits: Retaining Walls